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09/895,025	07/02/2001	Toshiaki Shinohara	210096US2	7453

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EXAMINER

VU, QUANG D

ART UNIT PAPER NUMBER

2811

DATE MAILED: 01/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/895,025

Applicant(s)

SHINOHARA, TOSHIAKI

Examiner

Quang D Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-8 is/are allowed.
- 6) ☒ Claim(s) 1-5,9 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

## **DETAILED ACTION**

### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 3, in lines 7-8, the phrase "...another one of the metal block and the ceramic substrate extends over all of the plurality of semiconductor elements for forming the insulation unit".

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3-4 and 9-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3, in lines 7-8, the phrase "...another one of the metal block and the ceramic substrate extends over all of the plurality of semiconductor elements for forming the insulation unit" is not understood. It is unclear how one of the metal block and ceramic substrate is to be provide in corresponding to at least one of the semiconductor elements and another one of the metal block and ceramic substrate extends over all of the plurality of semiconductor elements.

Claim 4, in lines 1-3, the phrase "...wherein the metal block includes a surface having a region larger than that of the jointing material on a side opposite to the jointing material" is

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unclear as to which side of the jointing material is used to determine the side of the jointing material which is smaller than a surface of a region of the metal block.

Claim 9, in lines 1-3, the phrase "...wherein the metal block includes a surface having a region larger than that of the jointing material on a side opposite to the jointing material" is unclear as to which side of the jointing material is used to determine the side of the jointing material which is smaller than a surface of a region of the metal block.

Claim 10, in lines 1-3, the phrase "...a gap between the metal block and the semiconductor element becomes wider as a distance from a center of the semiconductor element becomes longer; and the gap is filled with the jointing material" is not supported by the written description of the invention. Claim 6, the parent claim of claim 10, is directed to the second embodiment in figure 9. However, figure 9 never discloses the claimed limitation of claim 10. The claimed limitation of claim 10 is only applied to the device of figure 3 (the first embodiment of the invention).

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,291,065 to Arai et al.

Regarding claim 1, Arai et al. (figure 10) teach a semiconductor device comprising:  
a semiconductor element (5);

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a metal block (330) having a first surface and a second surface opposite to the first surface;

an aluminum wire (5g) having an electrode terminal joined to the first surface of the metal block (330); and

a ceramic substrate (301) joined to the second surface of the metal block (330) and having metal layers (312, 340) formed on both surfaces,

It is inherent that the semiconductor element (5) having an electrode for the I/O connection.

It is inherent that the semiconductor element (5) and the electrode are joined to the first surface of the metal block (330) through a jointing material.

Regarding claim 4, Arai et al. inherently teach the metal block (330) includes a surface having a region larger than that of the jointing material, which is in contact with the metal block.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,291,065 to Arai et al.

Regarding claim 2, Arai et al. differ from the claimed invention by not showing the metal layers formed on the both surfaces of the ceramic substrate are the same with each other in

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thickness. It would have been obvious to one having ordinary skill in the art at the time the invention was made for the metal layers formed on the both surfaces of the ceramic substrate are the same with each other in thickness because it depends on the amount of heat that dissipated by the integrated circuit.

Regarding claim 5, Arai et al. inherently teach the gap (a portion between the device [5] and the metal block [330]) is filled with the jointing material.

Arai et al. differ from the claimed invention by not showing a gap between the metal block and the semiconductor element becomes wider as a distance from a center of the semiconductor element becomes longer. It would have been obvious to one having ordinary skill in the art at the time the invention was made for a gap between the metal block and the semiconductor element becomes wider as a distance from a center of the semiconductor element becomes longer because it depends on the amount of heat that dissipated by the integrated circuit.

#### ***Allowable Subject Matter***

5. Claims 6-8 are allowed.

6. The following is an examiner's statement of reasons for allowance: The most closely related art, US Patent No. 5,291,065 to Arai et al. Arai et al. do not anticipate or render the claimed invention such as a resin insulating layer having a third surface and a fourth surface opposite to the third surface, the third surface being joined to the second surface of the metal block; and a resin package for sealing the metal block and the semiconductor element, wherein

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the fourth surface of the resin insulating layer is exposed, and the resin insulating layer has an elasticity higher than that of the resin package.

7. Claim 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 703-305-3826. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

qv  
December 30, 2002

*Steven Lope*